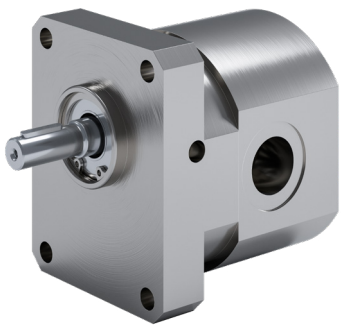
KRACHT®
FLUID TECHNOLOGY AND SYSTEMS

Pump technology

Gear pumps
KF 0



KRACHT®

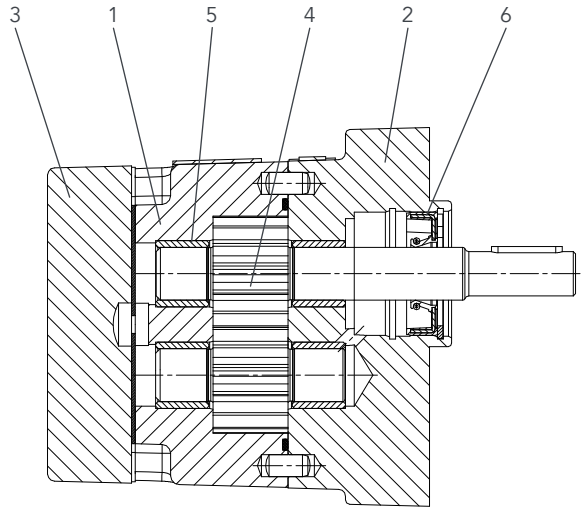
FLUID TECHNOLOGY AND SYSTEMS

Content

General KF 0

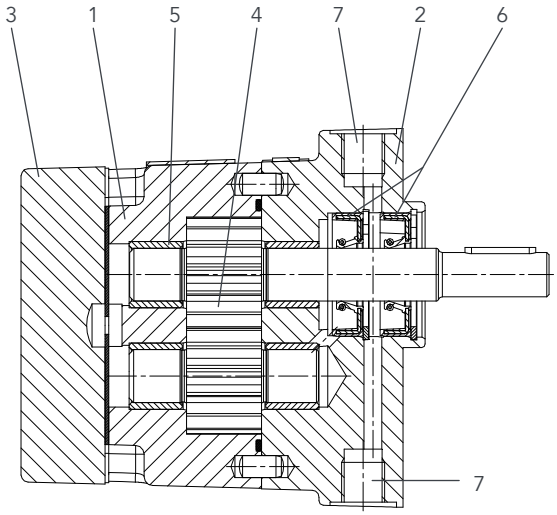
Construction

Gear pump with single radial lip-type seal



1 Housing
2 Flange cover
3 Cover plate
4 Gearing
5 Bearing bush
6 Single radial lip-type seal

Gear pump with double radial lip-type seal and threaded connection for quench



1 Housing
2 Flange cover
3 Cover plate
4 Gearing
5 Bearing bush
6 Double radial lip-type seal
7 Connection for quench

Description

In numerous technical processes dosing liquids is the focus of the task. PUR components, softeners, resins, lacquers, paints are just some of the most important liquids with a broad application range.
The accuracy, evenness and reproducibility with which these products can be processed are also decisive for the quality of the final product.
The gear pump size KF 0 is especially suitable for these applications.The KF 0 is an external gear pump with flow rates of 0.5 … 4 cm^3/rev.
The grading of the total of eight nominal sizes makes it easier to set the desired dosing ratios. The fine gearing with a high number of teeth guarantees a low-pulsation volume flow.

All gear parts and the bearing bushes are protected even in the standard design by a special coating against wear and corrosion, so that even filled media up to a specific grain size and hardness of the filled material can be conveyed. Because of the backlash dimensioning in combination with precise production the KF 0 has very good volumetric efficiency over a wide pressure range.
Various types of seals, such as single radial lip-type seals and double radial lip-type seals can be selected depending on the task, whereby the latter version enables operations with quench (quench chamber) to prevent the pumping medium from hardening or crystallising.
In combination with a flow meter and the electronics the KF 0 can be extended to a highly precise dosing unit.

Technical data

General characteristics

Fixing type	Flange
Hydraulic connection	Pipe thread
Speed	… 3000 1/min (Dependent on viscosity)
Direction of rotation	Clockwise or anticlockwise
Mounting position	**100** optional **107** horizontal **212** optional
Dimensions	Pages 8 … 10
Weight	2.2 kg

Hydraulic characteristics

Displacement in cm^3/rev		0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0
Working pressure inlet port	min max	-0.4 bar (-0.6 bar short for starting status) 2 bar
Working pressure outlet port	max	120 bar (Depending on the pumping medium, viscosity and displacement)
Ambient temperature		-20 … 60°C
Media temperature	max	NBR 90 °C FKM 150 °C PTFE 200 °C
Viscosity		10 … 20.000 mm^2/s

Available pump types

Special numbers	100 (Standard)	107	212
Available sizes	0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0	0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0	0.5 · 1.0 · 2.0· 4.0
Housing material	EN-GJL-250	EN-GJL-250	EN-GJS-600 nitro carbonized
Flange cover material	EN-GJL-250	EN-GJL-250	EN-GJS-600 tenifer nitrided
Bearing	Bearing bush	Bearing bush	Bearing bush
Bearing material	Steel ETG 100 chemically nickel plated with SiC inclusions	Steel ETG 100 chemically nickel plated with SiC inclusions	Steel ETG 100 chemically nickel plated with SiC inclusions
Gear material	Steel 1.7139 chemically nickel plated with SiC inclusions	Steel 1.7139 chemically nickel plated with SiC inclusions	Tool steel nitrided
Shaft seal	Single radial lip-type seal	Double radial lip-type seal	Double radial lip-type seal
Shaft seal material	NBR, FKM, PTFE	NBR, FKM, PTFE	NBR, FEP
Free of non-ferrous metals	yes	yes	yes

Maximum permissible working pressure depending on the viscosity

Nominal size	10 mm^2/s	30 mm^2/s	100 mm^2/s	> 500 mm^2/s
	Permissible working pressure in bar			
0.5	10	30	50	60
0.8	15	40	60	70
1.0	15	40	60	70
1.6	20	60	80	100
2.0	20	60	80	100
2.5	30	60	100	120
3.0	30	60	100	120
4.0	40	80	120	120

The values are valid for the speed range 1000 … 3000 1/min. Then max. working pressures must be reduced for speeds < 1000 1/min

Discharge flow and required drive power

Speed = 1450 1/min, Viscosity = 34 mm^2/s

Pressure in bar								Nominal size	Pressure in bar							
5	10	20	40	60	80	100	120		5	10	20	40	60	80	100	120
0.7	0.6	0.5	-	-	-	-	-	**0.5**	0.06	0.07	0.09	-	-	-	-	-
1.1	1.1	1.0	0.8	-	-	-	-	**0.8**	0.06	0.08	0.11	0.17	-	-	-	-
1.4	1.3	1.3	1.1	-	-	-	-	**1.0**	0.07	0.08	0.12	0.19	-	-	-	-
2.2	2.2	2.0	1.8	1.5	-	-	-	**1.6**	0.08	0.12	0.18	0.31	0.45	-	-	-
2.8	2.7	2.6	2.3	2.0	-	-	-	**2.0**	0.09	0.13	0.20	0.35	0.50	-	-	-
3.5	3.4	3.3	3.0	2.7	-	-	-	**2.5**	0.09	0.14	0.22	0.39	0.55	-	-	-
4.2	4.2	4.0	3.7	3.5	-	-	-	**3.0**	0.10	0.15	0.24	0.42	0.60	-	-	-
5.6	5.5	5.4	5.0	4.7	4.3	-	-	**4.0**	0.12	0.17	0.29	0.53	0.76	0.99	-	-

Discharge flow in l/min

Required drive power in kW

Speed n = 1450 1/min, Viscosity = 120 mm^2/s

Pressure in bar								Nominal size	Pressure in bar							
5	10	20	40	60	80	100	120		5	10	20	40	60	80	100	120
0.7	0.7	0.6	0.5	-	-	-	-	**0.5**	0.06	0.07	0.09	0.12	-	-	-	-
1.1	1.1	1.1	1.0	0.9	-	-	-	**0.8**	0.06	0.08	0.10	0.16	0.21	-	-	-
1.4	1.4	1.4	1.3	1.2	-	-	-	**1.0**	0.08	0.09	0.12	0.17	0.23	-	-	-
2.3	2.2	2.2	2.1	2.0	1.8	-	-	**1.6**	0.08	0.11	0.16	0.27	0.38	0.50	-	-
2.8	2.8	2.8	2.7	2.6	2.5	-	-	**2.0**	0.09	0.12	0.20	0.34	0.49	0.64	-	-
3.5	3.5	3.4	3.3	3.2	3.0	2.9	-	**2.5**	0.09	0.14	0.22	0.38	0.55	0.71	0.88	-
4.2	4.2	4.2	4.1	3.9	3.8	3.7	-	**3.0**	0.10	0.15	0.24	0.43	0.61	0.80	0.98	-
5.7	5.6	5.6	5.5	5.3	5.2	5.0	4.9	**4.0**	0.12	0.17	0.29	0.53	0.76	0.99	1.23	1.46

Discharge flow in l/min

Required drive power in kW

Type key

KF 0/	0,5	S	1	0	K	P0A	0DL	1	/	100
1	2	3	4	5	6	7	8	9		10

1 Product

2 Nominal size
0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0

3 Mounting	
S	Flange

4 Direction of rotation	
1	Clockwise
2	Anticlockwise

5 Outboard flange	
0	Without angle foot
F	Angle foot (On request)

6 Type of connection	
K	Pipe thread

7	
P0A	Cylindrical shaft end / Without 2nd shaft end / Cover plate

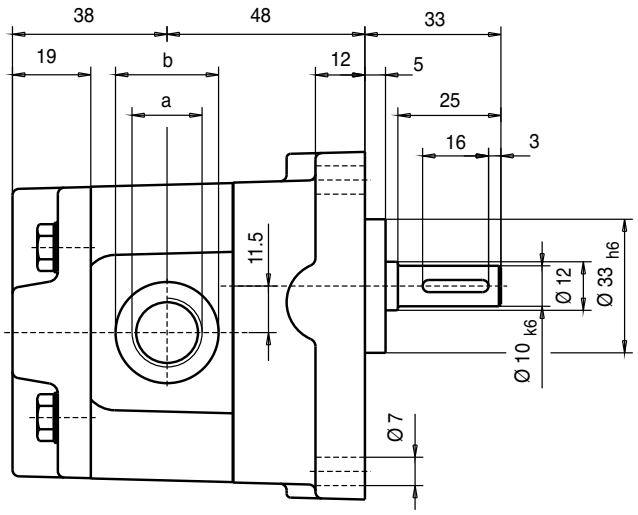
8	
0DL	Design code number / Housing material GG / Gearing design straight toothed

9 Seal	
1	NBR
2	FKM
32	PTFE

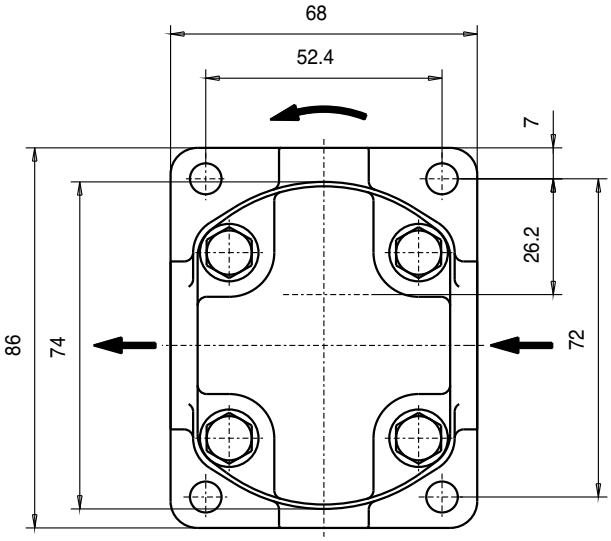
10 Special number	
100	With single radial lip-type seal (Standard)
107	With double radial lip-type seal, quench chamber connection top and bottom
212	With double radial lip-type seal, quench chamber connection top

Dimensions

Special number 100 (Standard)

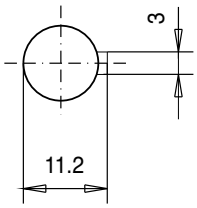


Direction of rotation shown: clockwise



Suction and pressure connection are the same size

Feather key
A 3 x 3 x 16
DIN 6885

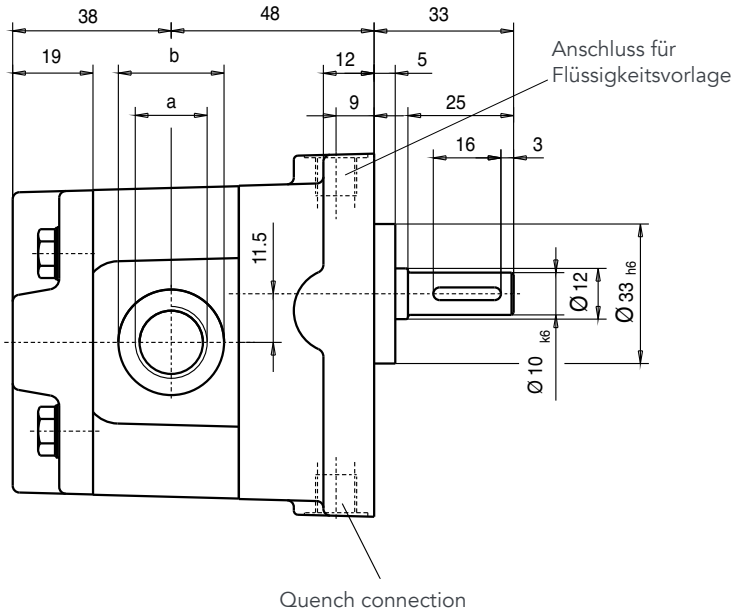


	Nominal size							
	0.5	0.8	1.0	1.6	2.0	2.5	3.0	4.0
a	G 3/8 – 13 deep			G 1/2 – 15 deep				
b	25			29				

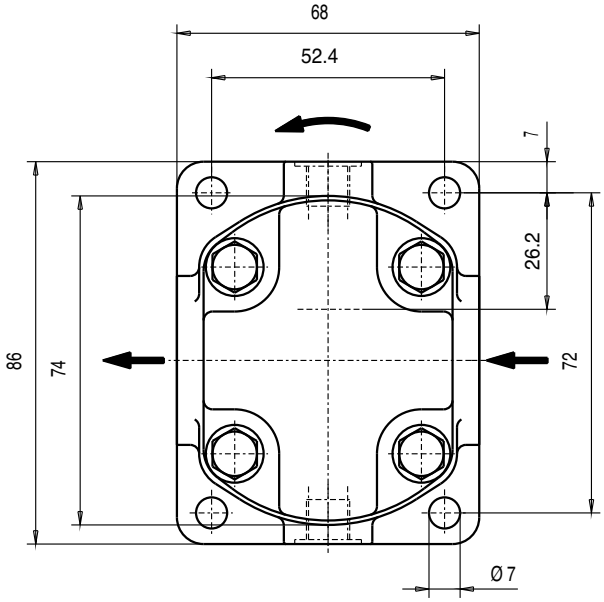
Dimensions in mm

Dimensions

Special number 107



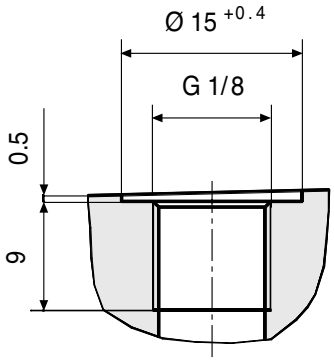
Direction of rotation shown: clockwise



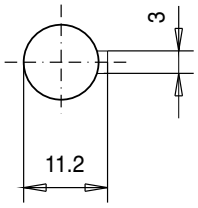
Mounting positon: horizontal

Suction and pressure connection are the same size

Quench connection



Feather key
A 3 x 3 x 16
DIN 6885

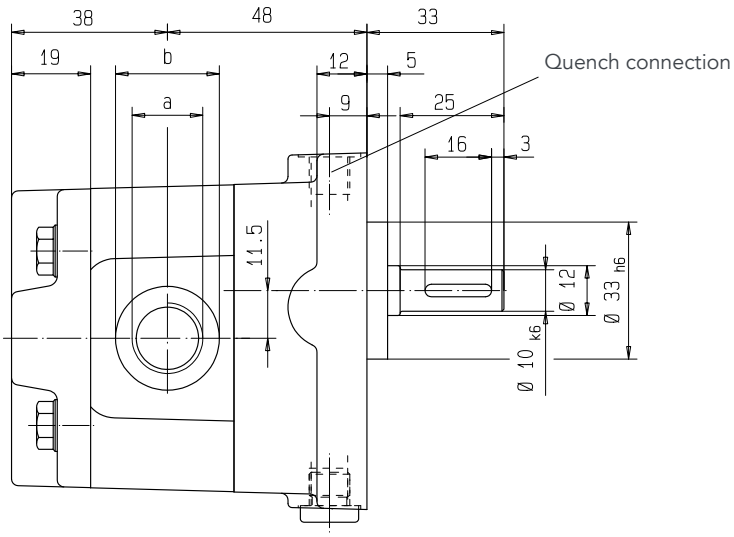


	Nominal size							
	0.5	0.8	1.0	1.6	2.0	2.5	3.0	4.0
a	G 3/8 – 13 deep			G 1/2 – 15 deep				
b	25			29				

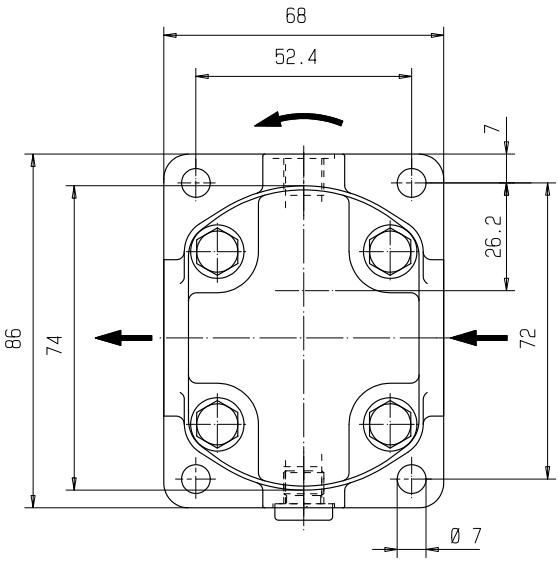
Dimensions in mm

Dimensions

Special number 212

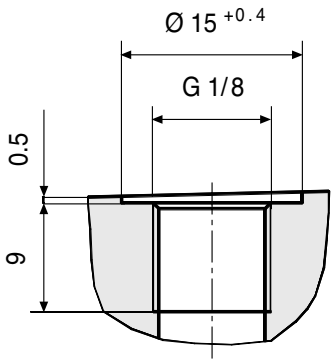


Direction of rotation shown: clockwise

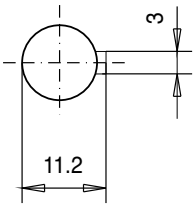


Suction and pressure connection are the same size

Quench connection



Feather key
A 3 x 3 x 16
DIN 6885



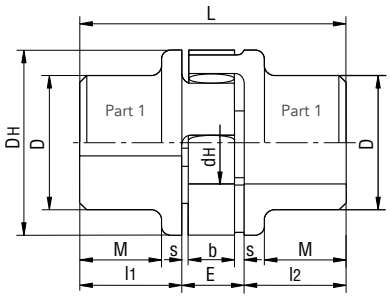
	Nominal size			
	0.5	1.0	2.0	4.0
a	G 3/8 – 13 deep		G 1/2 – 15 deep	
b	25		29	

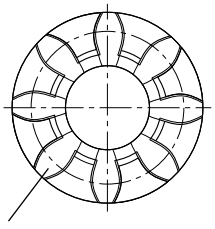
Dimensions in mm

Couplings

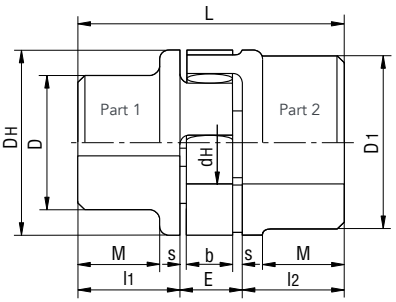
Technical data

Version A





Version B



	Ordering code	Coupling size	Hub material (Al)		Finished bore				Dimensions								
			Weight in kg	Moment of inertia in kgm²	min.		max.										
					Part 1	Part 2	Part 1	Part 2	l1/l2	E	s	b	L	M	D_H	D	D1	d_H
Version A	RA 14-Z 11/..-Z 11/..	14	0.045	0.000006	6	-	16	-	11	13	1.5	10	35	-	30	30	-	10
	RA 19-Z 25/..-Z 25/..	19	0.117	0.000023	6	-	19	-	25	16	2.0	12	66	20	41	32	-	18
Version B	RA 19/24-Z 25/..-Z 25/..	19/24	0.129	0.000033	6	19	19	24	25	16	2.0	12	66	20	41	32	41	18
	RA 24/28-Z 30/..-Z 30/..	24/28	0.290	0.000140	9	24	22	28	30	18	2.0	14	78	24	56	40	56	27

Ordering example

RA	19	–	Z	25/10	–	Z	25/14
Coupling type	Coupling size		Pump side cylindrical bore	Coupling hub lengt / Coupling hub bore		Motor side cylindrical bore	Coupling hub lengt / Coupling hub bore

Working temperature: -20 ... 80 °C
(Short duration temperature peaks up to 120 °C are permissible)

Weights and mass moments of inertia refer to max. finish machined bore without groove.

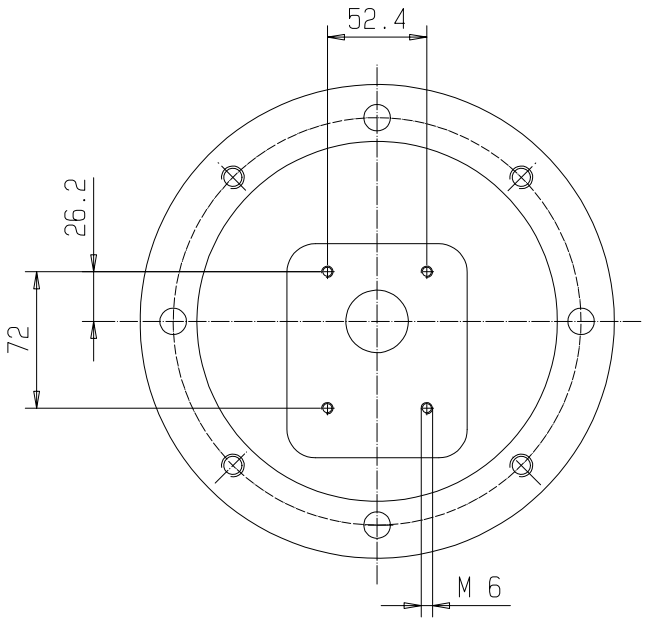
Finish-machined bores to ISO Fit H7

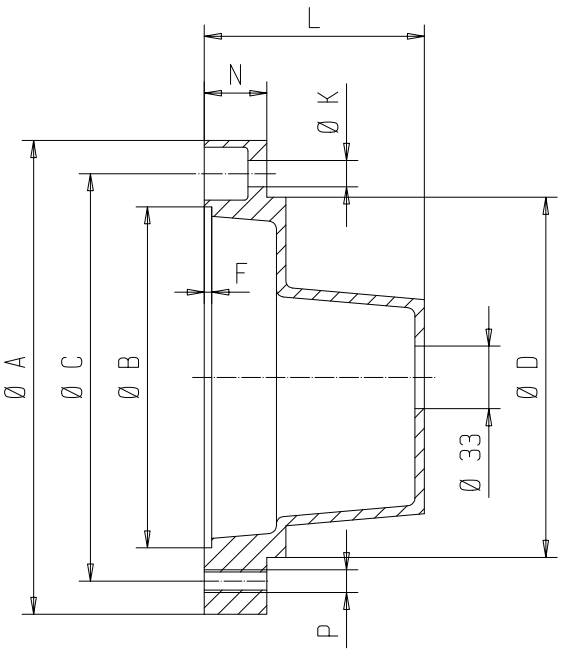
Feather key groove in accordance with DIN 6886 Sh.1

Dimensions in mm

Aluminium bell housing

Technical data



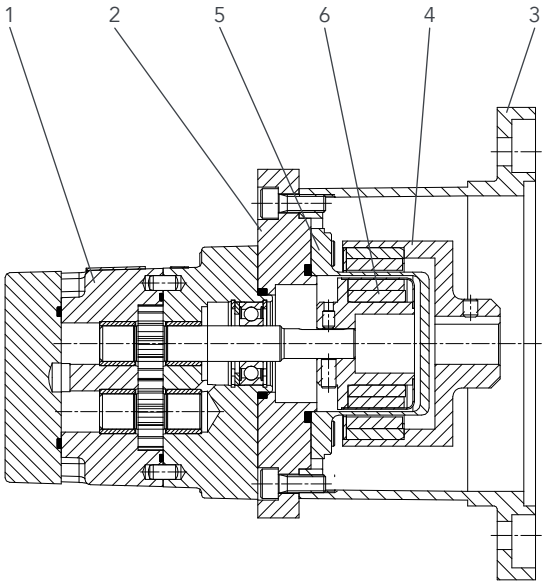


Motor size	Bell housing	Coupling	Dimensions									Weight in kg
			A	B	C	D	F	K	L	N	P	
63	Z0/140/70	RA14-Z11/10-Z11/11	140	95	115	95	4	9	70	17	M8	0.360
71 S	Z0/160/80	RA19-Z25/10-Z25/14	160	110	130	110	4	9	80	13	M8	0.490
71												
80 S	Z0/200/90	RA19-Z25/10-Z25/19	200	130	165	145	5	11	90	16	M10	0.600
80												
90 S	Z0/200/100	RA19/24-Z25/10-Z25/24	200	130	165	145	4	11	100	27	M10	1.345
90 L												
100 LS	Z0/250/116	RA24/28-Z30/10-Z30/28	250	180	215	190	4	14	116	33	M12	1.400
100 L												
112 M												

Dimensions in mm

General – KF 0 with magnetic coupling

Construction



1 Pump
2 Adapter
3 Bell housing
4 Outer rotor
5 Split case
6 Inner rotor

Description

With various applications conventional seals come up against their limits. Typical applications can be found in PUR plants, refrigerating installations and vacuum plant. It is possible to fit the KF 0 with a magnetic coupling for these applications.
The magnetic coupling serves as a shaft seal and to transmit the torque. The outer rotor of the magnetic coupling is placed on the motor shaft and the inner rotor directly on the pump shaft. The torque is transmitted between the outer and inner rotors through the magnetic forces.
The split case, which seals the pump hermetically, is located between the two rotors.
The magnetic coupling is used if an absolutely tight seal is required between the pump chamber and the atmosphere, e. g. for dosing isocyanate, where contact with the air would lead to an undesired hardening of the medium. It can be used in vacuum operations, e.g. filling brake liquid, and reliably prevents air penetrating into the system.
Non-leak operations are also guaranteed when used in sealed systems with a high admission pressure on the pump suction side.
The magnetic coupling is predestined for dosing hazardous and harmful media.

Technical data

General characteristics

Fixing typ	Flange
Hydraulic connection	Pipe thread
Speed	… 3000 1/min (Dependent on viscosity)
Direction of rotation	Clockwise or anticlockwise
Mounting	Optional

Hydraulic characteristics

Displacement in cm^3/rev		0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0
Working pressure inlet port		
Working	min max	-0.4 bar (Vacuum facility -0.92 bar) 16 bar (SS1)
Standstill	min max	-1 bar 16 bar (SS1)
Working pressure outlet port	max	25 bar (SS1)
Ambient temperature		-20 … 60 °C
Media temperature		-10 … 150 °C
Viscosity		10 … 20.000 mm^2/s

Materials

Pump	
Housing	GG 25, DIN 1691
Gearing	Steel 1.7139 chemically nickel plated with SiC inclusions
Bearing bushes	Steel ETG 100 chemically nickel plated with SiC inclusions
Seal	FKM
Magnetic coupling	
Inner rotor	Stainless steel 1.4571
Split case	Stainless steel 1.4571
Outer rotor	355J2F3 (St 52)
Magnets	Sm2Co17

Technical data

Magnetic coupling torques

MSA 46	3 Nm
MSA 60	7 Nm
MSB 60	14 Nm

Selection assistance

Pump	Coupling size	Permitted power in kW at 750 min^{-1}	Motor size	Permitted power in kW at 1000 min^{-1}	Motor size	Permitted power in kW at 1500 min^{-1}	Motor size	Permitted power in kW at 3000 min^{-1}	Motor size
KF 0	MSA 46	0.12	71	0.18	71	0.12	63	0.25	63
		-	-	-	-	0.18	63	0.37	71
		-	-	-	-	0.25	71	0.55	71
	MSA 60	0.18	80	0.25	71	0.37	71	0.75	80
		0.25	80	0.37	80	0.55	80	1.10	80
	MSB 60	0.37	90	0.55	80	0.75	80	1.50	90
		0.55	90	0.75	90	1.10	90	2.20	90

The values stated in the table refer to a maximum media temperature of 80 °C.
At media temperatures > 80 °C are to be selected if necessary stronger magnetic couplings.

To design the magnetic coupling, the following information needs to be available:

- Pump size
- Pump pressure (working and starting pressure)
- Working and starting viscosity
- Precise name of media, required static seals (if possible), possibly main media characteristics
- Drive motor power
- Speed or speed range
- Switch on type – direct or with frequency inverter
- Media and ambient temperature

Type key

KF 0/	0,5	S	1	0	K	P0A	0DL	2	/	235	MSA 46	A	1	-	160
1	2	3	4	5	6	7	8	9		10	11	12	13		14

1 Product

2 Nominal size
0.5 · 0.8 · 1.0 · 1.6 · 2.0 · 2.5 · 3.0 · 4.0

3 Mounting	
S	Flange

4 Direction of rotation	
1	Clockwise
2	Anticlockwise

5 Outboard flange	
0	Without angle foot
F	Angle foot (On request)

6 Type of connection	
K	Pipe thread

7	
P0A	Cylindrical shaft end / Without 2nd shaft end / Cover plate

8	
0DL	Design code number / Housing material GG / Gearing design straight toothed

9 Seal	
2	FKM

10 Special number	
235	Magnetic coupling type without flushing
244	Magnetic coupling type with flushing

11 Magnetic coupling size	
MSA 46	See page 15
MSA 60	See page 15
MSB 60	See page 15

12 Max. temperature of the magnetic coupling	
A	150 °C
B	300 °C

13 Max. permitted pressure in the split case	
1	16 bar
3	40 bar

14 Motor flange	
160	External diameter in mm

Notes

Notes

Notes

Pump technology

KRACHT®

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KF 0/EN/06.2023